A Practical Aspect in Designing an Integrated Conjoint Analysis Module for Undergraduate classes

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Abstract: The paper reviews a Fink's model of an integrated course design and examines the issues of creating significant learning experiences for the students. As an experiential adoption of the model, the paper represents the outcomes of designing and running a Conjoint Analysis Module in an Undergraduate class during the academic 2014/15. Analyzing students' experiences, some critical break points during the learning process are outlined, and students' misunderstanding of the analysis implications is boldly regarded. That reveals a need of adjusting to the module structure a relevant simulation tool for doing conjoint analysis in terms in its practical embodiment by making business decisions.

Keywords: Conjoint analysis, marketing simulation, Undergraduates.

1. Introduction

Teaching is engaged with two closely related activities of designing: design of the course itself by making a number of decisions about the way the course will be taught, and design of the teacher-student interactions as an implementation of that course. The concept of the second – "teacher-student interaction" – is to be considered as a matter of lecturing, leading discussions, running labs, advising, communicating by email, etc. As the recent academic research confirms, in instructional designing the teacher, from one side, is claimed to design comprehensive but "amendable to learning" course content and to transmit knowledge (explicitly) and understanding (implicitly) through appropriate activities and interactions with the students. Students, from other side, assume an attitude to be open to instruction, although they could easily skip important structural elements of a given module design considering them as too theoretical and abstract. That often causes preconditions that some break points within the learning process to emerge. Increasingly, students evaluate the importance of a course design from a single perspective: whether the instructional design brings them about the appreciation of how the theoretical principles' output can be relevant in practice.

The purpose of this paper is to review some of the mentioned challenges both parties – the teacher and the students – *could* overcome in order to pursue learning goals set within a course. As a context, within which an attempt to overcome those challenges is made, a Conjoint Analysis Module is academically designed for Undergraduate classes on the grounds on the Fink's model of Integrated Course Design. Sequentially, a relevant simulation tool to the module design is adjusted as an opportunity to provide a highly interactive student experience that will foster understanding of how conjoint analysis is used for managerial decision-making.

2. Fink's Model of Designing Integrated Courses in Higher Education

An exemplary concept for Integrated Course Design elaborated by L. Dee Fink as a systematic process for designing courses is introduced here. The process embraces basic components of the instructional design itself, but it takes place by assembling those components into a relational, integrated model. The basic components in the model more or less are the same as those found in other models of instructional design [2, 4, 8]: analyzing situational factors, formulating learning goals, designing feedback and assessment procedures, and selecting teaching/learning activities. Under the Fink's model these components are revealed and emphasized into their interrelatedness.

The first component in the Fink's model of Integrated Course Design is to gather information about the *situational factors* (e.g., how many students are in the course, what kind of prior knowledge are the students bringing to the course about this subject, etc.). Should the information about the situational factors has been gathered, the first decision is to be about setting *learning goals,* or what the teacher wants students to get out of the course. There are two relevant approaches to this task: content-centered and learning-centered ones. Fink puts special stress on the second approach and extends it to a *significant leaning approach* by proposing taxonomy of it. The approach consists of six major types of significant learning: 1) getting foundational knowledge, 2) learning how to learn, 3) caring with developing new interests and values, 4) developing skills, including the ability to manage projects, 5) human dimension of learning about oneself and the others and 6) integration by connecting ideas, people. The taxonomy identifies significant kinds of learning that the teacher may want to set as important learning goals of his/her course. A determined feature of this particular taxonomy is that each kind of learning is an interactive one – the more teacher realistically includes, the more goals will support each other, and the more valuable student's learning will be [3].

The next decisions within applying the model need to be on the *feedback and assessment* where an inquiry about what students will do to demonstrate they have achieved the learning goals already set. The advantage of working on the feedback-and-assessment at this early stage of the course design is that when it becomes clear about what constitutes successful student performance, it is much easier to develop effective teaching/learning activities. Precisely then, appropriate *teaching/learning activities* are to be formulated. If there are significant learning goals and effective assessment procedures, it is most likely to incorporate Fink's active learning modus into the course design. And finally, the course design should be checked for internal *integration* to make sure that all the components are in alignment and support each other: whether the learning activities are consistent with all the learning goals, and whether the feedback and assessment activities are consistent with both the learning goals and the learning activities.

3. Designing and Exercising an Integrated Conjoint Analysis Module

Conjoint analysis has become one of the most commonly used quantitative market research methods both relevant for managerial decision making, and successfully adopted towards the academic purposes. It has been successfully employed across a wide variety of industries to quantify consumer preferences for products and services. As such, the conjoint analysis was been determined as a significant syllabus component of a Marketing Analyses Course designed for an Undergraduate class at a higher educational institution in Bulgaria

during the academic 2014/15. Purposefully, it was represented as Conjoint Analysis Module (integrated within a Marketing Analyses Course). It was adjusted on the grounds of the systematically developed Conjoint Analysis Toolkit within the Harvard Business Publishing. Recently upgraded, the Toolkit includes three custom-blended modules: a) Conjoint Analysis: Online Tutorial, b) Conjoint Analysis: A Do-It-Yourself Guide and c) Marketing Simulation: Using Conjoint Analysis for Business Decisions.

The first component, the Tutorial, provides students with an overview of the analysis, its key concepts, and several "try-it" exercises for hands-on learning. Once students complete the Tutorial, they should know the basics of the conjoint analysis – namely, what the conjoint analysis is, how it is conducted, who tends to use it, when and why it is applied.

From that perspective, a possible approach to assign the Conjoint Analysis: Online Tutorial to bold the learn-by-exercise experience is preferably after an introductory class lecture. In this approach the students, who have gained a good theoretic sense of what the method is about, can solidify their knowledge and later focus on their interactive tasks that allow them to experience many of the concepts first-hand. [6] In particular, the Tutorial gives students the opportunity to walk through the major steps involved, namely: conceiving, designing, implementing, and using a conjoint study. As part of the completing the Tutorial, students also have the opportunity of taking part in a conjoint study themselves – thus gaining a "respondent's perspective". [7]

Being presented to the Undergraduate students for the purposes of the Conjoint Analysis Module, the access to and the use of the Tutorial was optional. However, being given such an opportunity, students did not get used of its pedagogical capacity and value, and its usefulness by means of the interactive 'try-it" exercises. There were three particular reasons for that students signalized about after being surveyed at the end of the course. From 37 valid responses 47% preferred to be assigned the alternative course modules included in the current Marketing Analysis Course – Perceptual Mapping and SWOT Analysis, rather than selecting the Conjoint Analysis Module, ranging it as the most difficult option to be assigned for a final evaluation; 37% pinpointed that the content of the Tutorial is basically covered by the uploaded teaching materials and the students could independently obtain a good theoretical sense of the analysis; 14% claim that the access to the Tutorial was not for free but at the expenses of the student; for 2% the language of instruction was not the native one. Considering only the positive disposition to the Conjoint Analysis Module, the proportion of the student responses proves that the students consider the Tutorial as relevant but they still prefer to learn passively using the materials adjusted by the lecturer.

The second pedagogically structured component of the Toolkit – Conjoint Analysis: A Do-It-Yourself Guide [5] – was also used as a source of designing a Conjoint Analysis Module for the Undergraduate class because it provides practical guidelines for implementing and analyzing a conjoint study. Namely, it covers designing, conducting and analyzing activities of the conjoint analysis survey. In addition, several helpful Microsoft Excel spreadsheets are included to accompany the note and can be used as aids where referred to.

The Guide focuses on the standard format of ratings-based conjoint analysis, in which consumers are to be asked to provide independent ratings of various profiles, on a numeric scale. This format is convenient to administer, and it yields data that are easy to analyze using standard software such as Microsoft Excel. Applying that type of conjoint analysis entails the following six steps: 1) select product attributes, 2) select levels for these attributes, 3) create product profiles, 4) collect data, 5) estimate partworths, 6) derive insights and make predictions.

In practical aspect, the students, who selected the Conjoin Analysis Module, got involved with the analysis by applying the Guide, and by following the enclosed case. Even, they understand more about the concept of the conjoint analysis while they were applying it in individually chosen cases, given as an assignment for their final evaluation. The outcomes of that basic qualitative research [1] after examining and analyzing these assignments gave evidence that the ability to apply conjoint analysis can be evaluated as above the average. Moreover, the Guide proved to be teachable and student-friendly because there were excellent graded assignments of students with non-marketing background who also attended the Marketing Analyses Course and chose to accomplish Conjoint Analysis Module.

Almost all of the students' analyses submitted (20 analyses) were applied for a chosen tangible product [Table 1], and only one – for a service [Table 2].

Table 1. An example of a student's application of the Conjoint Analysis for a tangible product.

STEP DESCRIPTION	**TANGIBLE PRODUCT**			
	Mountain Bike			
Product attribute selection	Frame type	Frame material	Tire size *(in diameters)*	Price *(in BGN)*
Attribute's levels selection	Cross Country	Aluminum	26"	≤ 2 500
	Enduro	Carbon	27.5"	2500 – 5000
	Downhill	Mixed	29"	≥ 5000
Product profile creation	• 15 suggested designs • *Base product profile* {Cross Country; Carbon-made frame; Tire of 27,5"; Price - under 2500 lv.}			
Data collection and procession	• Survey: online conducted by Google Spreadsheet • Sample: 22 respondents targeted (experienced bike-riders, Bulgarian, men, aged between 19 – 25) • 20 valid responses received • 15 product profiles (observations) studied: each option is rated by selecting the number on the seven-point preference scale (1 is lowest, 7 is highest) • Best rated profile before the Regression analysis {Downhill; Mixed materials; Tires of 27,5"; up to 5000 lv.} = 4,95 (average value)			
Partworths estimation *(Utility)*	Intercept = 4,85; *Ideal product profile* {Enduro/Downhill; Mixed frame; Tire of 27,5"; up to 5000 lv.} U (Ideal Profile) = 6,75			
Insights derivation and predictions	Attribute importance: n.a. Predicting consumer choice between two alternatives: n.a.			

Students usually define 4 – 4, 5 attributes of a product and about 2,5 levels per attribute. Using the Experimental Profile Design of the product, based on Microsoft Excel sheet, they create optimal set of profiles – between 9 and 16 – corresponding to the number of attributes and their levels. A fault-finding question students arise after generating product profiles is about the criteria and the need of defining Base Product Profile. (This is the profile of the product that consumers are or could be already aware of, or that the firm can produce if other thing been equal.) About 50 per cent of the analyses were based on quick surveys with simple rating-based questionnaires conducted online by Google Sheet. The other half of the analysis imitated conducted survey by rehearsing various ratings of the generated profiles. Nevertheless, the prevailing part of them correctly applied the Regression Analysis needed, which help them to estimate the partworths and to evaluate the utility of an Ideal Product Profile, also required by the conjoint concept.

Table 2. An example of a student's application of the Conjoint Analysis for a service.

STEP DESCRIPTION	**SERVICE**				
	Postgraduate education				
Product attribute selection	Country of origin of the university	Language of instruction	Period of study	Rating	Price *(in €/year)*
Attribute's levels selection	Bulgaria	Bulgarian	1–2 years	Top 100	Free
	UK	English	≥ 2 years	Top 1000	≤ 4000
	Germany	German			≥ 4000
Product profile creation	• 9 suggested designs • *Base service profile* {University in Germany; Instruction in English; 1 year study; Between Top 100 ≤ 4000 €/year }				
Data collection and procession	• Survey: online conducted by Google Spreadsheet • Sample: 20 respondents targeted (graduating students, Bulgarian, aged between 21 – 24) • 20 valid responses received • 16 product profiles (observations) studied: each option is rated by selecting the number on the seven-point preference scale (1 is lowest, 7 is highest)				
Partworths estimation *(Utility)*	Intercept = 5,27 U (Ideal Profile): n.a.				
Insights derivation and predictions	Attribute importance: n.a. Predicting consumer between two alternatives: n.a.				

An obvious gap in applying the conjoint analysis appears during its last essential step of conduction, when insights should be derived and consumer choice between two alternatives should be predicted. What students actually did was to boost their efforts towards building the theoretical framework of the analysis. They succeeded in identifying and estimate the two poles of the designed options – the Base Product Profile and the Ideal Product Profile, but they realized it was prelude to the constructive application of the analysis. Finally, students confessed they oversighted the applicability of the Tutorial and the opportunity to become aware with the entire analysis, especially with its last critical phase of predicting customer choices of the product. They confirmed they understood the concept of the conjoint analysis, but they still missed the knowledge of its practical implication for managerial decision-making.

4. Adjusting a Relevant Simulation Tool in Doing Conjoint Analysis for Business Decisions

The concerns of the above uplift couple of methodical inconsistencies of the initial design of the Conjoint Analysis Module within the Marketing Analysis Course arise. Redefining the current *learning objectives* should bring an apparent induction about the core of the module. Setting the objective "ability to apply conjoint analysis for business decisions" should require a revision of the *module structure* in terms of the sequence of the

content provided. Then, the major issues should be identified and the proper array for introducing them to the students should be re-planned. Moreover, the initial ideas for the assignments or topics that would reflect the increasing complexity of the subject as students move from issue to issue should be reconsidered.

In that respect, the *instructional strategy* also should be revised. This requires some new activities to be set up. Students need to be given opportunities both to practice and to self-assess the quality of their performance. Obviously both the Online Tutorial and the Do-It-Yourself Guide can get students ready and prepared for later work. But although Undergraduate students can yield from the Tutorial and the Guide as instructional references, the need to practice the conjoint analysis from decision-making perspective still remains demanding. Formulated as a learning objective, it could be pursued by the third component of the comprehensive Conjoint Analysis Toolkit called *Marketing Simulation: Using Conjoint Analysis for Business Decisions*© [Fig. 1].

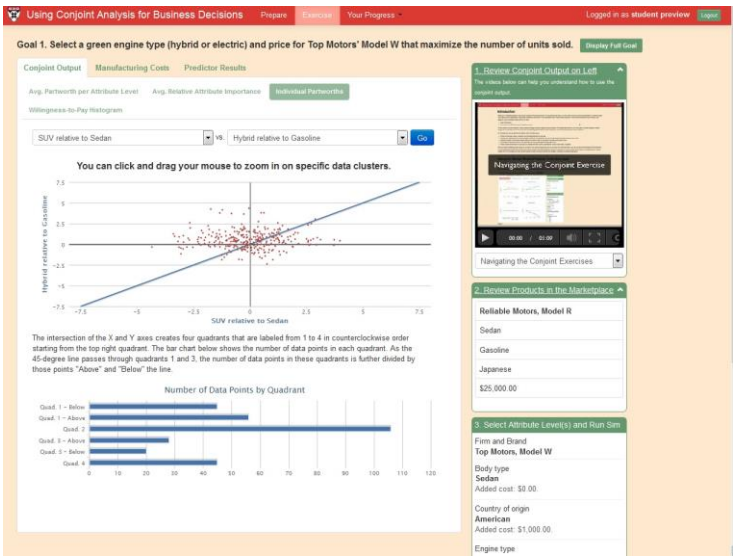


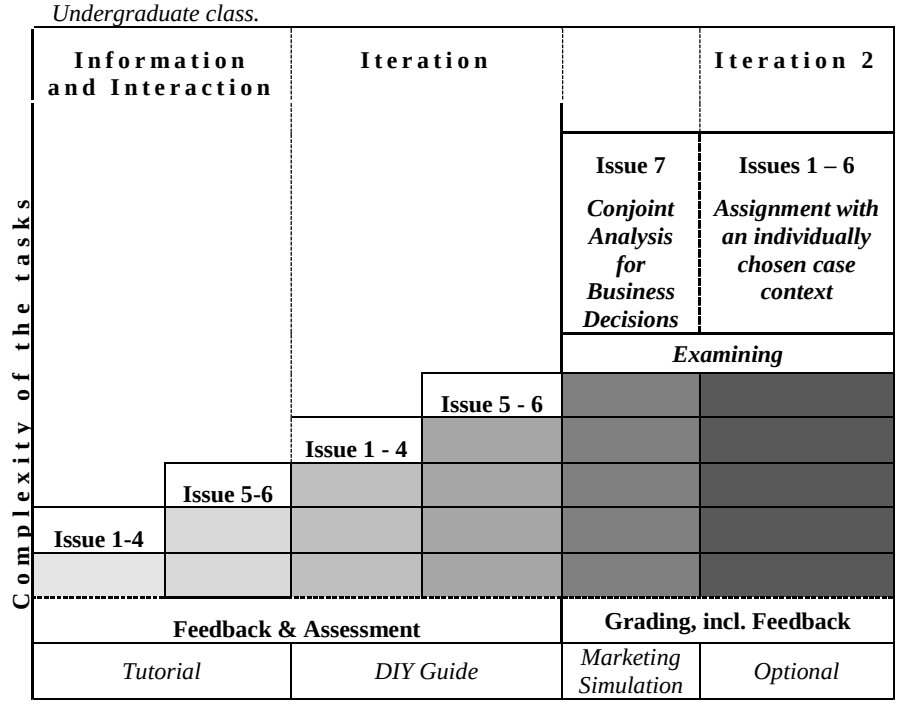
Fig. 1. Interface of the Marketing Simulation: Conjoint Analysis for Business Decisions.

The simulation is designed to reinforce student understanding and use the conjoint analysis as one of the most popular market research methods in academia and practice. Released in June 2015 its goal is to provide students with an appreciation of how conjoint analysis output can be relevant in practice, and to provide an interactive experience of using conjoint analysis for managerial decision-making. Delivered online, the simulation gives students exposure to key business concepts such as demand curves, segmentation, profit functions, competitive responses, vertical and horizontal differentiation, optimal pricing, niche vs. mass market strategies, product portfolio management, and brand equity. [7] In all cases, the link to conjoint analysis and its output is made explicit. It includes two scenarios: the Green Car exercise and the Over-the-Counter Cold and Flu Medicine exercise. Across these two scenarios, students work on a series of goals and face a host of competitive settings. In order to inform their decisions in each of the settings, students have access to the results of a conjoint analysis study. They can see these results in various ways and can run market simulations (e.g., what would demand in units or sales be for each product and at what price, simulated under various conditions).

After considering some of the situational factors of conducting the Conjoint Analysis Module in an Undergraduate class during the academic 2014/15, a revision of the experimented module design is being suggested. Taking into account (a) the specific context of the teaching-learning process, (b) the nature of the subject and (c) the characteristics of the examined class, the Fink's concept of aligning the learning objectives with an appropriate module structure and instructional strategy has been adjusted [Table 3]. The revision is based on an iterating procedure of repeating the conjoint analysis application with an increasing complexity of the assignments.

The first step called "Information and Interaction" stage is about to become aware with the concept of the conjoint analysis issue-by-issue (e.g. from sub-topic 1 to sub-topic 6), using the Conjoint Analysis Tutorial or some recommended readings. "Iteration" stage is a repetition of the analysis – again issue-by-issue (again from sub-topic 1 to sub-topic 6) – and it is designed to get students acquainted to the application of the conjoint analysis propped on "A Do-It-Yourself Guide".

Table 3. A revised structure of a Conjoint Analysis Module conducted and examined within an Undergraduate class.



At this stage the student's role is assumed to be, more or less, reflective into the teacher-student educational encounter, rather than proactive. "Iteration 2" stage would be an option for a final exam assignment and students themselves should choose the case to implicate into the conjoint analysis study. An alternative exam option would be conduction of the Conjoint Analysis: Marketing Simulation. In that case, students simultaneously will be instructed and be given proper feedback because of the learning-by-doing nature of the tool. But although that marketing simulation here is being charged with higher expectations, there is no history of how it has been exercised and perceived by the students so far. It is newly

released and the intentions about the possible student perceptions of learning-by-playing it remain hypothetical.

5. Conclusion

The purpose to design the iteration-based content structure of the Conjoint Analysis Module within a Marketing Analyses Course targeted for Undergraduates during the academic 2014/15 was to use the Fink's Significant Learning Concept into a concrete academic context and to be given relevant insights about the actual implications of that module. Built on the grounds of the Conjoint Analysis Toolkit©, systematically elaborated by Ofek and Toubia within Harvard Business School, the module gives promises to provide students with a significant learning groundwork by exercising the analysis. In that respect, the spinning *modus operandi* pursued is learning-by-doing. Practicing the conjoint analysis is then supported by an online-based tutorial and interactive tools.

A demanded practical aspect in designing a Conjoint Analysis Module for Undergraduates is mainly considered here as adjusting a simulation tool that reinforces student understanding and use of one of the most popular market research methods in academia and practice – conjoint analysis. The Marketing Simulation: Using Conjoint Analysis for Business Decisions© provides students with an appreciation of how conjoint analysis output can be relevant in practice, and to provide a highly interactive experience of using the analysis for managerial decision-making.

For that reason the described Conjoint Analysis Module for Undergraduates could be considered as a map for future qualitative in-class research of pursuing given academic outcomes.

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